

Session Code: TLS343
tools & languages

Visual Studio "Whidbey": Advanced Debugging Techniques

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The Road to Longhorn



Visual Studio "Orcas"

- WinFX, Indigo, Longhorn

Visual Studio "Whidbey"

- RAD debugging
- Customizable data display
- Power debugging tools
- Support for Win64, Yukon, Office

October 2003
Professional
Developer
Conference

Visual Studio .NET 2003

- Better collection display (ArrayList, Hashtable)
- IntelliSense in Immediate window

Visual Studio .NET 2002

- One UI for all languages (VB, C#, C++, J#)
- Cross-language debugging
- Debugging support for all tiers

Agenda

- Tools for RAD development
 - Write and debug VB code, *rapidly!*
- New features for viewing data
 - Debug complex types
 - Customize data display
- Debugging new platforms
 - 64-Bit – *double the debugging fun!*
 - SQL Server “Yukon”
- The debugger toolbox
 - Power tools for power users

Tools for RAD Development

Debugging VB Code

- Edit and Continue
 - Fix errors while debugging
- New Exception Assistant dialog
 - Provides access to exception details
 - Includes troubleshooting tips for handling the exception

Debugging VB Code

demo

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Viewing Data in Visual Studio

- Many tools for looking at data
 - Autos
 - Locals
 - Watch
 - etc.
- All data is there, but may be hard to get to

Viewing Data in VS.NET 2003

demo

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Viewing Data in VS.NET 2003

- Demo recap
 - DataTips
 - Debug code in the editor
 - Good for simple data
 - For complex objects, displays name of type instead
 - Data windows
 - Show hierarchical view
 - Difficult for viewing complex data and collections
 - Need support for customization

Viewing Data in VS “Whidbey”

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Customizing Data Display

- Customize data display at different levels
- Most trivial level of customization
 - Override ToString()

```
public class Employee
{
    private string firstName;
    private string lastName;
    // ...

    public override string ToString()
    {
        return (this.firstName + " " + this.lastName);
    }
}
```

Customizing Data Display - Part I

demo

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Customizing Data Display (2)

- Overriding ToString() may not be enough
- You may want to
 - Reduce amount of data
 - Format display
- Use attributes
 - DebuggerDisplayAttribute
 - DebuggerBrowsableAttribute
 - DebuggerTypeProxyAttribute

Customizing Data Display - Part II

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Customizing Data Display (3)

- Data windows only show hierarchical view
- Not ideal for viewing some types
 - DataSet
 - Image
 - XML
- Extend the debugger!
 - Write your own custom viewer

Customizing Data Display - Part III

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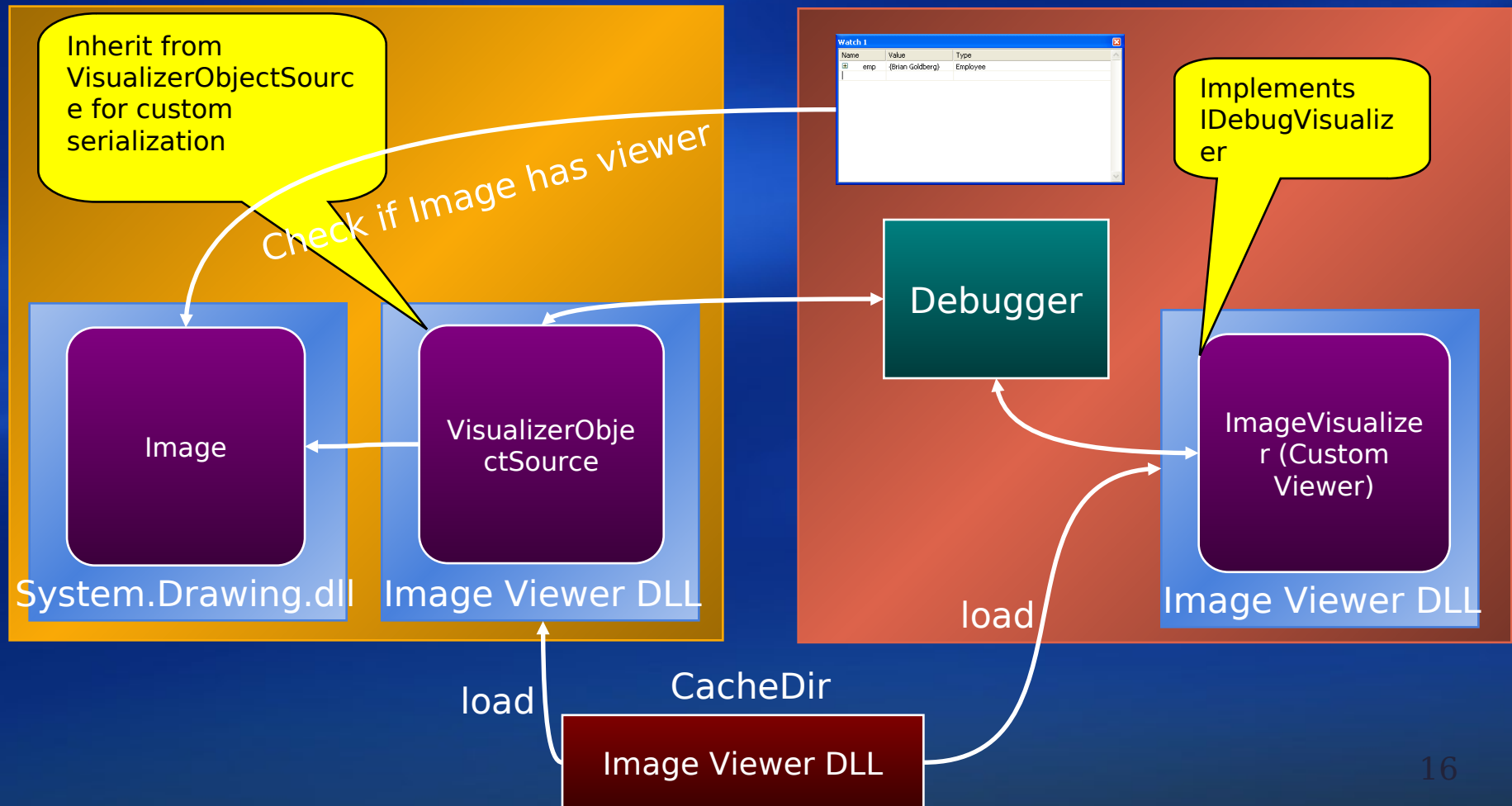
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Customizing Data Display

(4) Architectural overview

Application

Visual Studio



Customizing Data Display

Summary

- Three levels of customization
 - Override ToString()
 - Use attributes to modify Data windows
 - Write your own viewer
- Great way to improve productivity

Debugging C++ STL

Types

- Difficult to debug STL types today
- In Whidbey, more intuitive view for
 - Commonly used STL containers and types
 - map, vector, string, set, etc.

```
using namespace std;
typedef map<string, int> STRING2INT;

int main()
{
    STRING2INT MyMap;

    // Fill MyMap with the days of the week, each
    // mapped to an int

    MyMap["Monday"] = 1;
    MyMap["Tuesday"] = 2;
    MyMap["Wednesday"] = 3;
    // etc.
}
```

Debugging C++ STL Maps

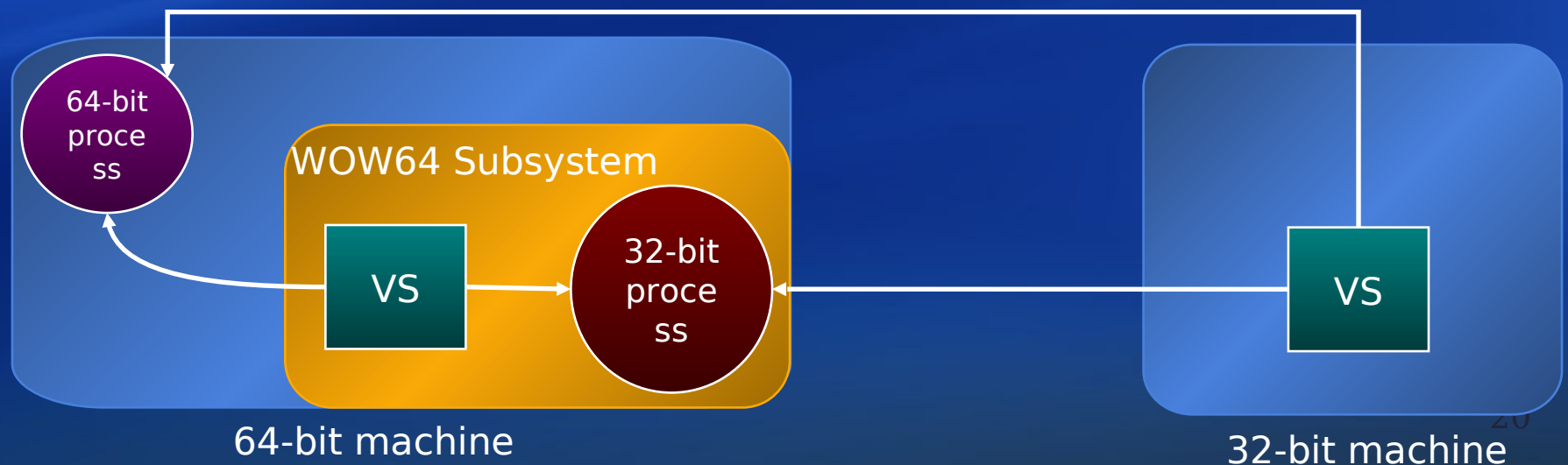
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64-Bit Debugging

- Debug:
 - 32-bit processes on WOW64
 - 64-bit processes on 64-bit machine
 - Locally and remotely
 - Managed and unmanaged code
- Available for both IA64 & AMD64



Debugging SQL Server “Yukon”

- Seamlessly step cross-language
 - T-SQL and SQL/CLR code
- Set breakpoints anywhere
- Both local and remote debugging
- Inspect anything
 - SQL types
 - UDTs
 - Managed objects

Debugging SQL Server “Yukon”

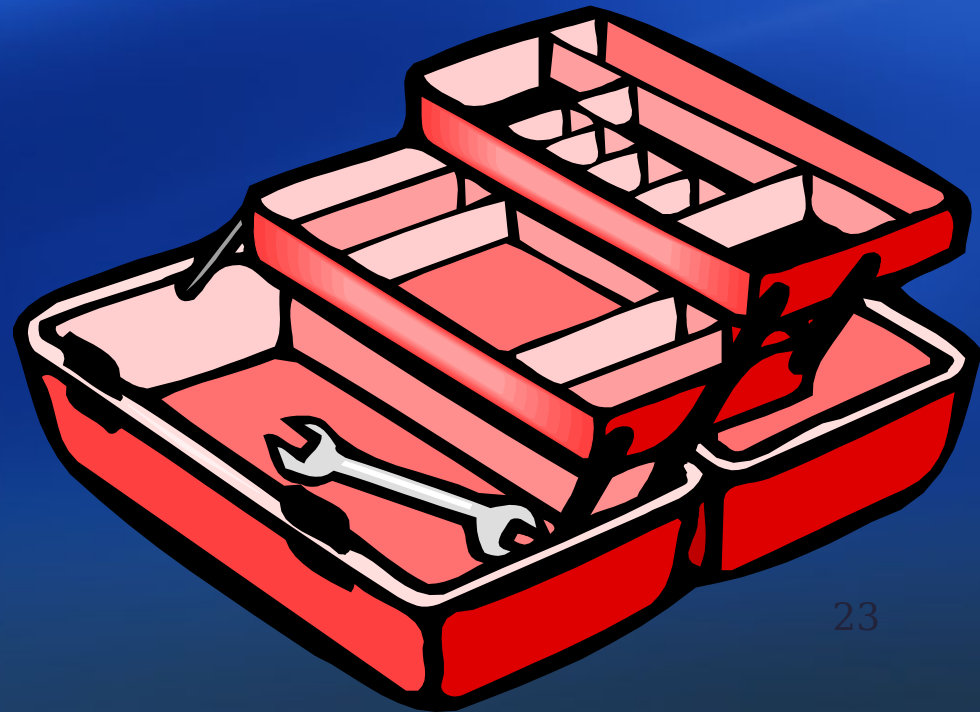
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The Debugger Toolbox

- Symbols management *(demo)*
- “this” breakpoint for managed objects
- Secure and robust remote debugging
- Tracepoint
- Processes window
- Debug In Zone
- Console window
- Per thread breakpoints



The Debugger Toolbox:

- Symbols Management

demo

Summary

- New tools for viewing data
 - Reduce debugging time
 - Enhance developer productivity
- VB RAD debugging
 - Fix errors rapidly
 - Test new functionality
 - Modify existing functionality
- New platforms support
 - 64-Bit
 - SQL/CLR
- Tools to power your debugging!

Additional Resources

- Send us feedback!
 - vswish@microsoft.com
 - Public newsgroups
 - microsoft.public.vsnet.debugging
 - microsoft.public.vc.debugger
- Other resources
 - Chats
 - <http://microsoft.com/communities/chats/default.aspx>
- Ask the Experts (10/28 6:30-9:00 PM)
- Booth (10/29 9:30-11:45AM)
- Developer Lounge
 - (Near Hall A on 1st floor)



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